

CLAIMS

What is claimed is:

- 1 1. A method for calculating application verb response times, comprising:
 - 2 (a) receiving packet data;
 - 3 (b) aggregating the packet data into flows;
 - 4 (c) identifying application verbs and information relating to them associated with
 - 5 the flows; and
 - 6 (d) storing the information relating to the application verbs;
 - 7 (e) wherein the information relating to the application verbs is capable of being used
 - 8 to calculate response times associated therewith.
- 1 2. The method as recited in claim 1, and further comprising determining whether
- 2 the packet data is associated with a new flow.
- 1 3. The method as recited in claim 2, wherein if the packet data is determined to be
- 2 associated with a new flow, further comprising creating a flow, creating a data
- 3 structure, and inserting the data structure into the flow.
- 1 4. The method as recited in claim 3, wherein the creation of the data structure
- 2 includes identifying a protocol identifier associated with the flow, and
- 3 determining a number of known application verbs associated with the protocol
- 4 identifier.

- 1 5. The method as recited in claim 4, wherein the creation of the data structure
2 further includes allocating memory for the data structure based on the number of
3 known application verbs associated with the protocol identifier.
- 1 6. The method as recited in claim 4, wherein the number of application verbs
2 associated with the protocol identifier is determined utilizing a map.
- 1 7. The method as recited in claim 6, wherein the map maps to a RMON tree.
- 1 8. The method as recited in claim 1, and further comprising inserting a data
2 structure into the flows.
- 1 9. The method as recited in claim 8, wherein the aggregation includes populating
2 and updating the data structure with the information.
- 1 10. The method as recited in claim 9, wherein the aggregation further includes
2 identifying application verbs, determining whether the application verbs are
3 valid, and updating a state machine if it is determined that the application verbs
4 are valid.
- 1 11. The method as recited in claim 9, wherein the aggregation further includes
2 determining whether a response is complete, and calculating a response time if it
3 is determined that the response is complete.
- 1 12. The method as recited in claim 10, wherein the aggregation further includes
2 determining whether the state machine is in a valid state, and utilizing the state
3 machine as being representative of the response time if it is determined that the
4 state machine is in a valid state.

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- 1 13. The method as recited in claim 1, wherein the information relating to the
2 application verbs is capable of being used to calculate response times associated
3 therewith in real-time.
- 1 14. A computer program product for calculating application verb response times,
2 comprising:
3 (a) computer code for receiving packet data;
4 (b) computer code for aggregating the packet data into flows;
5 (c) computer code for identifying information relating to application verbs
6 associated with the flows; and
7 (d) computer code for storing the information relating to the application verbs;
8 (e) wherein the information relating to the application verbs is capable of being used
9 to calculate response times associated therewith.
- 1 15. The computer program product as recited in claim 14, and further comprising
2 computer code for determining whether the packet data is associated with a new
3 flow.
- 1 16. The computer program product as recited in claim 15, wherein if the packet data
2 is determined to be associated with a new flow, further comprising computer
3 code for creating a flow, creating a data structure, and inserting the data structure
4 into the flow.
- 1 17. The computer program product as recited in claim 16, wherein the creation of
2 the data structure includes identifying a protocol identifier associated with the
3 flow, and determining a number of application verbs associated with the
4 protocol identifier.

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- 1 18. The computer program product as recited in claim 17, wherein the creation of
2 the data structure further includes allocating memory for the data structure based
3 on the number of known application verbs associated with the protocol
4 identifier.
- 1 19. The computer program product as recited in claim 17, wherein the number of
2 known application verbs associated with the protocol identifier is determined
3 utilizing a map.
- 1 20. The computer program product as recited in claim 19, wherein the map maps to
2 a RMON tree.
- 1 21. The computer program product as recited in claim 14, and further comprising
2 computer code for inserting a data structure into the flows.
- 1 22. The computer program product as recited in claim 21, wherein the aggregation
2 includes populating and updating the data structure with the information.
- 1 23. The computer program product as recited in claim 22, wherein the aggregation
2 further includes identifying application verbs, determining whether the
3 application verbs are valid, and updating a state machine if it is determined that
4 the application verbs are valid.
- 1 24. The computer program product as recited in claim 22, wherein the aggregation
2 further includes determining whether a response is complete, and calculating a
3 response time if it is determined that the response is complete.

- 1 25. The computer program product as recited in claim 23, wherein the aggregation
2 further includes determining whether the state machine is in a valid state, and
3 utilizing the state machine as being representative of the response time if it is
4 determined that the state machine is in a valid state.
- 1 26. The computer program product as recited in claim 14, wherein the information
2 relating to the application verbs is capable of being used to calculate response
3 times associated therewith in real-time.
- 1 27. A system for calculating application verb response times, comprising:
2 (a) means for receiving packet data;
3 (b) means for aggregating the packet data into flows;
4 (c) means for identifying information relating to application verbs associated with
5 the flows; and
6 (d) means for storing the information relating to the application verbs;
7 (e) wherein the information relating to the application verbs is capable of being used
8 to calculate response times associated therewith.
- 1 28. A data structure for calculating application verb response times, comprising:
2 (a) a plurality of application verb objects for identifying information relating to
3 application verbs associated with a flow; and
4 (b) a state machine object;
5 (c) wherein the application verb objects and the state machine object are capable of
6 being used to validate response times.
- 1 29. A method for calculating response times, comprising:
2 (a) receiving packet data;
3 (b) aggregating the packet data into a flow;

- 4 (c) identifying information relating to application verbs associated with the flow;
- 5 (d) storing the information relating to the application verbs in a data structure;
- 6 (e) inserting the data structure in the flow; and
- 7 (f) mapping the data structure to a remote monitoring (RMON) tree.

1 30. A method for calculating response times, comprising:

- 2 (a) receiving packet data;
- 3 (b) determining whether the packet data is associated with a new flow;
- 4 (c) if the packet data is determined to be associated with a new flow:
 - 5 (i) creating a flow,
 - 6 (ii) providing a notification of the flow,
 - 7 (iii) creating a data structure in response to the notification, the creation of the
 - 8 data structure including:
 - 9 1) identifying a protocol identifier associated with the flow,
 - 10 2) caching the protocol identifier,
 - 11 3) determining a number of known application verbs associated with
 - 12 the protocol identifier, and
 - 13 4) allocating memory for the data structure based on the number of
 - 14 known application verbs associated with the protocol identifier,
 - 15 and
 - 16 (iv) inserting the data structure into the flow; and
- 17 (d) aggregating the packet data by:
 - 18 (i) identifying application verbs in the flow,
 - 19 (ii) determining whether the application verbs are valid,
 - 20 (iii) updating a state machine if it is determined that the application verbs are
 - 21 valid,
 - 22 (iv) determining whether a response associated with the flow is complete,

- 23 (v) calculating a response time if it is determined that the response is
- 24 complete,
- 25 (vi) determining whether the state machine is in a valid state, and
- 26 (vii) utilizing the data structure as being representative of the response time if
- 27 it is determined that the state machine is in a valid state.

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